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ABSTRACT

This primer is intended to provide college financial aid professionals with a background in fundamental areas of economics. Its goal is to provide a stronger understanding of the key principles that shape need analysis systems. Part 1 presents basic economic concepts and discusses their application to college enrollment and student aid. These include the concepts of supply, demand, price sensitivity, price discrimination, opportunity costs, costs and revenues, market structure, horizontal and vertical equity, human capital, spillover of external factors, incomplete information, consumption vs. investment goods, merit goods, and commercial models and higher education. Part 2 considers specific components of the need analysis system from an economic perspective. The underlying assumptions of the system and specific components of the methodologies are examined. These include: defining necessities, snapshot vs. long-term financial capacity, defining living standards, treatment of multiple children in college, defining income and assets, determining whose income and assets are relevant, allowances against income, tax on savings, home equity, pension assets, allowances against assets, marginal tax rates, and tax rates on assets. (JLS)

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A Primer on Economics for Financial Aid Professionals

Sandy Baum
Skidmore College

Jointly Sponsored by
The College Board
and the National
Association of
Student Financial
Aid Administrators
(NASFAA)

June 1996

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Sandy Baum
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Preface

Today's financial aid professionals face a wide range of pressures. Our institutions look to us to administer multi-million dollar financial aid budgets, comply with reams of federal and state regulations, and manage an institutional financial aid system that promotes equity while meeting institutional enrollment and financial goals.

The College Scholarship Service (CSS) and the National Association of Student Financial Aid Administrators (NASFAA) are concerned about the rising level of complexity involved in the day-to-day lives of financial aid professionals. On-going discussions and workshops have focused attention on the ever greater demands thrust upon financial aid staff. As part of their mission, both CSS and NASFAA have worked to provide us with more tools and information to allow us to achieve higher levels of technical training and the basic education we need to do our jobs more effectively. In this challenging and changing environment, and given the shared mission of CSS and NASFAA, it makes perfect sense for the two organizations to collaborate on this publication that improves their members' understanding of the economic principles underlying need analysis.

In years gone by, the financial aid community had both time and opportunity to study, understand, discuss and criticize the need analysis formula (Uniform Methodology (UM)) that was used as a basic tool in their profession. Changes to the UM were approved by a committee of financial aid professionals and U.S. Department of Education representatives. We had the ability to directly influence the formula.

Today, the Federal Methodology (FM) is changed at the discretion of the Congress, and is driven more by politics and the federal budget than economic analysis. Still, the basic structure of the need analysis formula is based on economic concepts used by our predecessors of the 1960's and 1970's.

Before computer systems dominated our work lives, we calculated and recalculated family contributions by hand using paper and pencil. As a result, we knew how the formula worked at a very detailed level and tended to understand the economic principles that ruled this formula. Today, many financial aid professionals receive a basic course in need analysis, but rely on the computer to do the computations.

In the past, a financial aid professional could alter either the data or the formula to achieve different results for students as a group or as individuals. At present, the federal formula cannot be modified--changes must be made only to data. This, too, inhibits the understanding of how the formula that delivers financial aid works.

Financial aid is strategically important to institutions. At the same time, there is constant pressure on financial aid professionals to moderate growth in financial aid dollars. Thus we are faced with a seemingly impossible task: to use financial aid to recruit highly-sought students and improve retention of current students, while limiting the growth of the financial aid budget as tuition costs rise ahead of inflation.

Bearing all the above issues in mind, CSS and NASFAA asked Sandy Baum to write the *Primer on Economics for Financial Aid Professionals*. This *Primer* is intended to provide financial aid professionals with background in fundamental areas of economics. The goal is to have the reader finish this manuscript with a stronger understanding of the key principles that have and should shape our need analysis systems and guide professional judgment decisions. We encourage you to study the *Primer*, to discuss it at professional meetings, and to share it with colleagues. It provides an excellent foundation for enrichment and growth.

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I am grateful to the participants in the NASFAA Need Analysis Forums held in May of 1995 and to the past and current members of the CSS Committee on Standards of Ability to Pay and Financial Aid Standards and Services Advisory Committee, who taught me most of what I know about need analysis. I would also like to thank Carolyn Shaw Bell, Jerry Davis, Janet Hunter, Tim Koechlin, Don Saleh, Jim Scannell, and the staff of both NASFAA and CSS for their helpful comments and suggestions on this project.

The ideas expressed here are my own and do not reflect the views of either NASFAA or the College Board.

Introduction

The financial aid profession has long recognized that sound economic principles should underlie aid allocation formulas. However, many aid administrators are unfamiliar with basic economics. This *Primer* is an attempt to make economic concepts and their potential application to need analysis more accessible to financial aid professionals.

The term need analysis is commonly used to refer both to the methodology used to determine eligibility for specific student aid sources and to the methodology for estimating students' and families' expected contributions based on ability to pay. Need is defined as the difference between cost of attendance and expected contribution. Aid administrators who distribute need-based student aid generally rely on formulas developed by the federal government, by educational institutions, or by organizations such as the College Board. The discussion which follows assumes that the goal of need analysis is finding a reasonable measure of ability to pay.

While too many people working in aid offices don't have adequate time to provide an in-depth answer to the question of the appropriate amount of funding for a particular student, for many others, professional judgment about individual cases is a major part of the job. In addition, as individual institutions search for creative ways to make their limited aid dollars go farther, both in terms of providing educational opportunity and in terms of enrollment management goals, financial aid administrators will become increasingly involved in an individualized process of allocating aid funds. An understanding of the underlying economic principles will inform and facilitate this process.

The *Primer* takes two approaches to linking economic theory to need analysis. Part I presents basic economic concepts and discusses their application to college enrollment and student aid. The concepts were chosen because of their particular significance for understanding either college pricing systems or the ability and/or willingness to pay for higher education. For example, everyone reading this *Primer* is aware that colleges

charge different students different amounts for the same educational services. The debate about whether net price differentials should be based on ability to pay (need), on merit, or on willingness to pay is heated and widespread. What is less familiar to many people engaged in this debate is the standard economic concept of price discrimination. Higher education is not unique in selling the same product to different consumers at different prices. An understanding of the conditions required for price discrimination (the technical name for this practice) and of the implications of this pricing policy in general, can provide useful background for higher education administrators grappling with college pricing and financial aid policy decisions.

Some more general economic concepts can also provide a valuable framework for analyzing financial aid. The concept of opportunity cost, for example, is one that even students who are not drawn into the economic mode of reasoning find staying with them as a useful way of thinking about daily life. Opportunity cost simply refers to the idea that any choice we make involves a sacrifice, a foregone opportunity. The cost of attending college is not just the tuition, but also includes the wages foregone by students who choose to postpone entry into the labor market. Ignoring this part of the cost of higher education significantly distorts both our understanding of costs and our ability to advise students responsibly about their choices.

Part II analyzes specific components of the need analysis system from an economic perspective. Both the underlying assumptions of the system and some specific components of the methodologies are examined. There are a variety of methodologies currently in use. The Federal Methodology (FM), legislated by Congress during the 1992 Reauthorization of the Higher Education Act, is the mandated allocation formula for Federal student aid. It represents the second iteration of the Congressional attempt to legislate a need analysis system, the Congressional Methodology (CM) having been in effect from 1988 through 1992. Before 1988, colleges and universities were allowed to distribute aid based on the methodology of their choice, commonly the Uniform Methodology (UM) developed by the member institutions of the College Board and

American College Testing (ACT), in cooperation with the Department of Education, through the Keppel Task Force. FM still contains many of the details which were part of UM, but also differs in fundamental ways from the need analysis methodology developed by institutions. In particular, FM does not consider assets for most families with incomes below \$50,000, ignores both home equity and family farm values for all aid applicants, and includes no minimum student contribution.

Institutions which have little more than federal funds are obligated to rely on FM for their distribution. But other colleges and universities, primarily in the private non-profit sector, have significant institutional funds to distribute. Many of them rely on a non-federal formula, such as the College Board's Institutional Methodology (IM), or some modification of that formula. This methodology resembles the earlier UM and CM, considering home equity, family farms, and other assets for all families and incorporating a minimum contribution for all students. It has, however, been modified in a variety of ways in recent years.

While many institutions have their own financial aid forms and alter the standard formulas in a variety of ways, this discussion of need analysis methodology necessarily focuses on the most commonly used need analysis principles. Instead of going through any particular formula step by step, the discussion focuses on the basic framework any need analysis system must take. That is, income and assets must be defined and then the methodology must determine which components of income and assets should be taxed to determine expected contributions, as well as what the appropriate tax rates are. While the discussion in this *Primer* addresses general principles of need analysis methodology, it also calls attention to ways in which the commonly used formulas differ from each other, to widely recognized shortcomings in the standard formulas, and to some of the proposals currently being discussed within the aid profession which might improve the need analysis system.

Readers of this *Primer* may find it useful to keep some basic principles of public policy analysis in mind. Economists tend to evaluate public policy in terms of the two

criteria of equity and efficiency. The question of whether or not a policy is fair is obviously subjective, but an understanding of who is helped and who is hurt is fundamental to making such a judgment. Determining whether policies make the most productive possible use of limited resources is also complicated, but can be facilitated by a thorough understanding of some basic economic ideas.

At times there is a trade-off between equity and efficiency, but the two may also be complementary. Even in a policy like need analysis, primarily designed for reasons of equity, paying attention to the incentive effects, the behavioral responses, and the impact of a policy on market outcomes is vital. In rough terms, if we waste a lot of money trying to help people in ways which end up being counterproductive, we will find ourselves with lower levels of overall resources, unable to attain our most basic goals. If the need analysis system punishes people for certain choices or behaviors — such as saving — those behaviors will be discouraged and we will end up with fewer dollars to distribute to those most in need. In other words, the efficiency aspects of the need analysis system cannot be ignored.

This *Primer* will not answer all the questions of its readers, nor will it reveal the secret to the perfect need analysis system. But it should help its readers to develop new perspectives and to gain more insight into how the need analysis system works and into ways to improve it.

PART I:

Basic Economic Concepts

Economic theory is designed to elucidate the workings of markets and the allocation of scarce resources in society. Pricing, demand, and distributional issues, all fundamental to understanding college financing, are central to economic analysis. Below, a set of economic concepts with particular applicability to college enrollment and financial aid are defined and explained. In each instance, a general explanation is supplemented by a discussion of the particular relevance of the concept for understanding paying for college.

Supply and demand, the first two concepts introduced, are the basic building blocks of economic theory. Many people have a general sense that increased demand likely to raise prices and that surpluses may be caused by increased supply. But a more precise understanding of these fundamental concepts is key to working with them and to comprehending complex economic situations.

Supply

What is the relationship between the number of students a college wishes to enroll and the tuition it can charge?

Figure 1 shows a graph which relates the price of a seller's product to the quantity of the product the seller is willing to supply over a given period of time. The *upward sloping* curve suggests that as the price the seller can command for its product increases, it is willing to supply larger quantities. Supply curves are frequently assumed to look this way, at least in the short run. This is because of the capacity constraints created by any given level of plant and equipment.

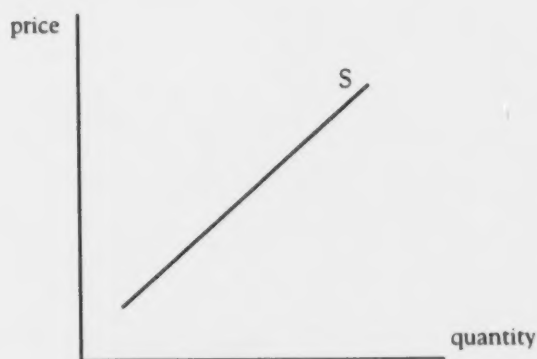


Figure 1: Upward sloping supply

Price is measured on the vertical axis and quantity is measured on the horizontal axis. An upward sloping supply curve indicates that in any given period of time, assuming costs of production are constant, a supplier is willing to supply larger quantities of its product when the selling price of the product is higher.

The cost of producing additional units of output tends to increase as output levels increase. The supplier may hire more workers to produce more, but these workers have limited space and a limited amount of equipment with which to work, so they can't contribute as much as workers added earlier. Only rising prices can make it profit-maximizing to incur these costs. Suppliers may also be willing to produce larger quantities at higher prices, as suggested by an upward sloping supply curve, because as the price rises, alternative uses of resources become relatively less appealing.

If colleges have upward sloping supply curves, it means they will seek to increase the size of their student bodies only if the tuition they can charge increases. However, there are a variety of reasons why some colleges might be willing to increase the size of their student bodies without raising their prices. As is the case for any supplier, the cost conditions at any particular institution will determine the shape of its supply curve.

The supply curve may be *horizontal* over some range, as illustrated in Figure 2. This is the supply curve for a college which is willing to enroll a significantly higher number of students without raising its price. This would be true if the cost of educating additional students is relatively low and essentially constant, as it would be for schools with excess capacity.

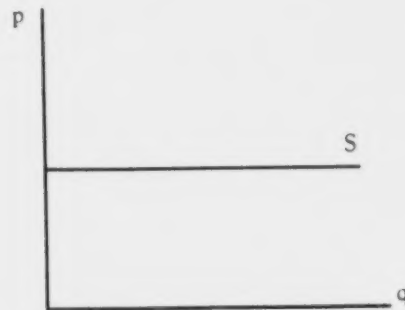


Figure 2: Horizontal Supply

A horizontal supply curve indicates that the supplier is willing to supply larger quantities of output without raising the price of its product. This would be the case if additional units of output can be produced at the same incremental cost as that generated by earlier units.

On the other hand, if they are operating at capacity, colleges may not be able to increase the number of spaces supplied without undertaking considerable capital investment. It might be necessary to build new classrooms or residence halls, for example. This would create a *vertical* supply curve, as illustrated in Figure 3, at least in the short run. Increasing tuition levels would not elicit increased quantity supplied, given the existing plant size.

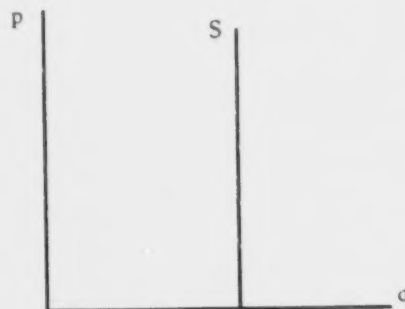


Figure 3: Vertical Supply

A vertical supply curve indicates that the supplier will not increase the quantity of output it supplies, regardless of how much the price rises. This would be the case if there are severe capacity constraints.

An additional complication is the reality that colleges and universities are not profit-maximizing enterprises. Even if more students would generate additional revenues without significantly increasing costs, institutions may determine that increasing the size of the student body would require lowering admission standards and thus diminishing the quality of their product. In this case, they may arbitrarily create a vertical supply curve, placing a limit on the quantity of places they are willing to supply, regardless of how much potential students are willing to pay and of the short-run cost of accommodating them.

Institutions in different situations will find themselves with dramatically different supply schedules. A small number of colleges and universities in this country have more qualified applicants willing to pay the full price than they can reasonably accommodate. They have vertical supply curves. In contrast, an increasing number of institutions are having considerable difficulty attracting enough students with enough ability to pay to operate anywhere near capacity. For these schools, the supply curve is probably close to horizontal. If people with the requisite funds were to appear, the schools would expand their enrollments without raising prices. Normally, only as they approach capacity would they find their incremental costs of additional students increasing and their supply curves becoming steeper. Figure 4 shows a supply curve which is horizontal when the college is operating far below capacity and gradually becomes vertical as it reaches capacity, or as its costs of educating additional students rise for some other reason.

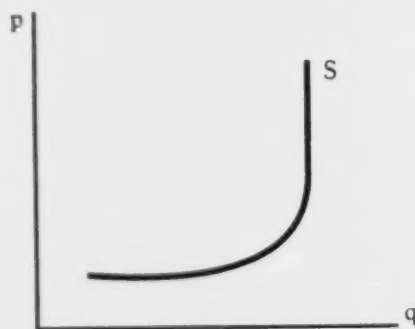


Figure 4: Curved Supply

This supply curve is horizontal at low levels of output, but becomes steeper as capacity is approached.

Some of the unique characteristics of education may cause institutions to find that as they enroll more students, incremental costs rise even though there are no capacity constraints. This might occur because of the variation in the characteristics of the students. Unlike other products, education is not something customers can purchase and take away, with the producer's involvement ending once payment is made. The characteristics of the students can significantly affect the resources required for the institution to provide an adequate education. If colleges fill their beds by accepting students with limited academic preparation, with severe learning disabilities, or with other characteristics which make it more difficult for them to succeed, the incremental cost of educating these students will be higher and tuition may have to increase to cover these costs. The interdependency of student quality and cost of education may create an upward sloping supply curve, reflecting the higher costs of serving additional students, even when there is considerable excess capacity.

Demand

What factors affect the number of people willing and able to enroll in a college?

A basic rule of economics is that the quantity of goods and services people choose to buy depends on prices. When apples are expensive, people may choose to buy fewer apples and more oranges. As the price of apples falls, more people will pay attention to the maxim that an apple a day keeps the doctor away.

There are downward sloping *demand curves* for most goods and services, including higher education. That is, as the net price increases, quantity demanded decreases. As prices go up, some people decide going to college is not worth it after all. Although many students are willing to pay higher prices for institutions they perceive as providing higher quality education, low-cost institutions attract other students, who would never

consider paying the prices charged by expensive private colleges. The slope of the demand curve reveals how much the quantity demanded changes when the price changes.

When a demand curve relating price and quantity is drawn, many factors have to be assumed to remain constant. These include the size of the population, consumers' preferences, income levels, the distribution of income, and the prices of goods and services which might be substitutes or complements (goods that are consumed together with the good in question). If any of these factors change, the whole demand curve will move.

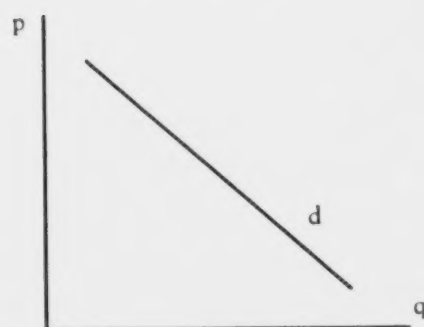


Figure 5a: Demand

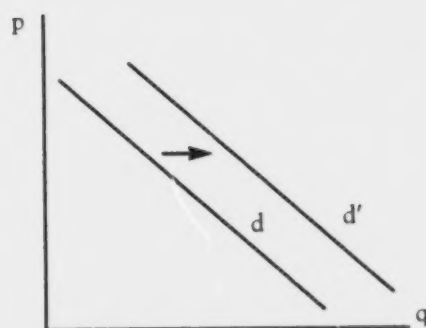


Figure 5b: Increase in demand

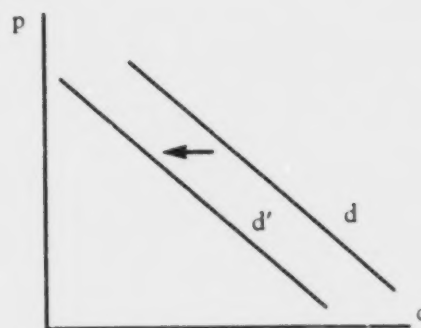


Figure 5c: Decrease in demand

Figure 5a is a downward sloping demand curve, indicating that as the price of the product falls, the quantity demanded over any given period of time increases. Figure 5b shows an outward shift of the demand curve. This increase in demand might occur as the result of increased incomes or an increase in the priority consumers place on the product. Figure 5c shows a decrease in demand. At any possible price, consumers are willing to purchase less than they were before. Declining incomes or the increased availability of substitutes might cause this shift.

For example, an increase in the population of recent high school graduates in the Northeast will increase the number of people interested in attending Skidmore College (a private liberal arts college in upstate New York) at any possible price. If general skepticism about the value of a liberal arts education increases, the opposite will occur — the demand curve will shift in. In a recession, when incomes are generally lower, fewer people will be able to pay the price. This will also be the case if inequality in the distribution of income increases. If incomes become much more concentrated at the top, while a small minority can easily pay for a private college education, it is out of reach for a greater and greater proportion of high school graduates unless financial aid increases enough to compensate for declining incomes.

The effect of substitutes and complements can be seen by looking at public college tuition levels. If Skidmore's price remains constant, but tuition at the State University of New York increases, the demand for a Skidmore education is likely to increase. More people will be willing to pay Skidmore's price, not because they are responding to changes in Skidmore's price or because their preferences have changed, but because the price of a close substitute — a reasonable alternative to Skidmore — has increased. When complementary goods become more expensive, on the other hand, the demand for a Skidmore education will decline. If, for example, students from other parts of the country are affected by a dramatic increase in airfares or if personal computers become a necessity for college students, Skidmore's demand curve will shift in.

It is important to note that demand is a function both of people's preferences and of the amount of money they have available. In other words, both *willingness* and *ability* to pay matter. Standard economic discussions of demand tend to focus on willingness to pay. People are willing to pay higher prices for the first pizza they buy each week, when they crave pizza, than for the tenth, when they are getting bored by eating too much of the same thing. In the jargon of economic analysis, the marginal utility of pizza declines as the consumer has more and more of it in a given time period. The amount

of satisfaction delivered by the first pizza is greater than the amount of satisfaction delivered by the tenth, and it is this added satisfaction which determines willingness to pay.

However, the demand curve doesn't just measure how much people "want" something. It measures effective demand, or demand backed up by dollars. A classic example is the comparison of the amount a poor man is willing to pay for milk for his baby to the amount a wealthy man is willing to pay for milk for his cat. Does the wealthy man care more about his cat than the poor man cares about his baby? Does he get more satisfaction from the milk? Or is the poor man simply unable to come up with the cash to pay for the milk?

The lesson here is that the demand curve necessarily represents willingness to pay combined with ability to pay. The fact that demand is satisfied, that the market is in equilibrium with everyone willing to pay the price getting the quantity of milk they demand, does not mean that everyone has what they need, that everyone is happy, or that society should feel comfortable with the outcome.

Financial aid administrators are increasingly aware of the distinction between ability to pay and willingness to pay. The whole need analysis system is designed to ameliorate the problem illustrated by the milk example. The concept of need-based aid rests on the premise that people interested in attending college and able to benefit from the opportunity should have access, regardless of their ability to pay. Need-based financial aid constitutes an attempt to shift the demand curve out by increasing the resources available to people to pay for college. (Another way of looking at the phenomenon is in terms of net price. Financial aid lowers the effective price and at lower prices, more people are able to pay.)

Recently, people with sufficient resources to pay for college have become more resistant to paying. They are demanding financial aid in order to keep them from choosing less expensive alternatives. In other words, willingness to pay has come to the fore as an issue in the demand for higher education. Changing priorities and a declining willingness to sacrifice consumption of other goods and services are shifting the demand

curve in. Because of this phenomenon, financial aid is increasingly being used to supplement the resources of those who are able but *unwilling* to pay, rather than subsidizing those who otherwise could not *afford* college.

It is clear that a family with no assets whose annual income is less than the level of tuition cannot afford to pay for college, but in most cases "affordability" is much more subjective. How much any aid applicant can afford clearly depends on values, priorities, and willingness to sacrifice other goods and services. This means that the line between ability to pay and willingness to pay is a blurry one. While a need analysis system can attempt to measure ability to pay based on financial capacity, the demand for education will always be based on a combination of ability and willingness to pay, and the adequacy of financial aid funding levels and allocation formulas will depend on both of these aspects of demand.

Price Sensitivity

How sensitive are potential students to changes in tuition levels?

Many colleges are interested in knowing how much their enrollments are likely to decline if they raise their net tuition and fees. This question relates to the *elasticity* of *demand*. If demand is elastic, a small increase in price will lead to a relatively large decline in the quantity demanded. The demand for Bic pens is elastic because people can easily substitute other brands of pens. The demand for automobiles is elastic because a small percentage increase in price constitutes a large chunk of the average consumer's budget. In addition, consumers can fairly easily decide to keep their old cars for an additional year.

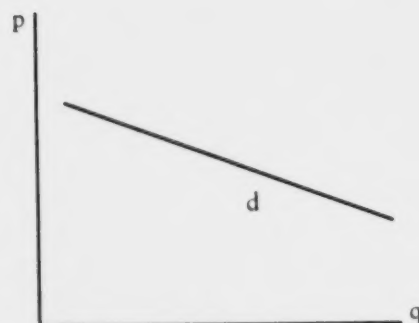


Figure 6a: Elastic demand

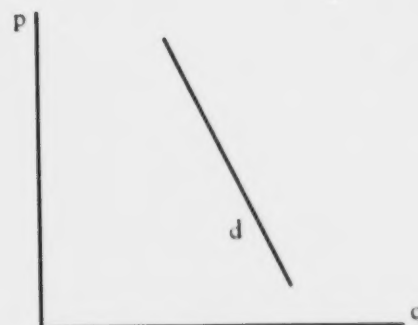


Figure 6b: Inelastic demand

In Figure 6a, the quantity demanded changes considerably in response to small changes in price. In Figure 6b, demand is inelastic, with the quantity demanded not very sensitive to changes in price.

The demand for some other products is inelastic. This means that although there is probably a downward sloping demand curve, the quantity demanded is not very sensitive to changes in price. The demand for insulin is inelastic because it is a necessity for those who use it and there are no good substitutes. The demand for salt is inelastic because even if the price doubles or triples, consumers won't notice it much in their budgets.

The elasticity of demand for college is an important question because it has a major impact on institutional revenues. Suppose net tuition increases by 5% this year. If enrollments decline by exactly 5%, revenues will remain constant. If demand is inelastic and enrollments decline by less than 5%, total revenues will increase. But if demand is elastic and enrollment decline by more than 5%, total revenues will decrease as a result of the increase in tuition. While precise measures of elasticity are difficult to obtain, most of the available evidence suggests that the actual elasticity of demand for college education in general, as well as for particular institutions, is lower than much of the public discussion about the dangers of rising tuitions might suggest.

Price Discrimination: Different Prices for Different Students

What circumstances allow colleges to charge different prices to different students and why does this make sense?

Many products are sold under circumstances that require the seller to charge the same price to all consumers. The supermarket would not operate very well if everyone were bargaining over the prices of crackers and hamburger meat. There are other products whose sellers can charge different prices to different groups of consumers, depending on the consumers' willingness to pay. Airlines charge business passengers more than vacation travelers. Business travelers have *inelastic* demand, and are not likely to cancel their trips because of fare increases. Demand for vacation travel is much more *elastic*. Airlines manage to charge different prices to these different groups by imposing restrictions on the lower fares which business travelers are frequently unable to meet. Charging different prices to different consumers is called *price discrimination*. If producers can price discriminate, charging each consumer the maximum amount he or she is willing to pay, they can reap higher profits than if they charge everyone a price low enough to get the last consumer into the market.

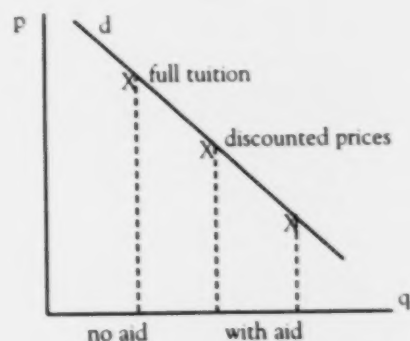


Figure 7: Price Discrimination

The downward sloping demand curve indicates that some consumers are willing to pay higher prices than others for the same product. Suppliers which price discriminate charge each consumer a price as close as possible to individual willingness to pay. Financial aid for selected students is an example of price discrimination.

Another example of price discrimination is journal prices which are much higher for libraries than for individual subscribers. This price discrimination works only as long as the consumers can be prevented from trading. If individual faculty members were to pass their personal subscriptions on to the library, the pricing system would fall apart. If the supermarket tried to charge chocolate addicts more for candy than they charge dieters, the dieters would soon start buying candy at low prices and selling it to the chocolate addicts.

Colleges and universities *price discriminate* when they offer financial aid. The net price is different for different students, despite the fact that they are purchasing the same commodity. Need-based aid allows students with limited financial resources, who would not attend if they were charged the full sticker price, to pay a lower price. Need-based aid price discriminates on the basis of *ability to pay*. Other forms of student aid may price discriminate on the basis of *willingness to pay*. Highly qualified students may be less willing to pay for College X because they have a choice of many other selective institutions. Less qualified students will be more willing to pay — they will have less elastic demand — because they have fewer options.

Opportunity Cost:: What Are the Trade-offs?

What is the real total cost of attending college?

Economists do not measure costs simply in terms of out-of-pocket expenditures. The true cost of an activity includes all of the resources devoted to that activity which could have been used for another purpose. The total cost of attending college includes not just tuition, but also foregone earnings. If a student could be earning \$20,000 a year by working full-time but chooses to attend college instead, that \$20,000 opportunity cost is part of the real total cost of attending college.

The *opportunity cost* of a particular activity is the best possible alternative to that activity. If you decide to spend the day catching up on work in the office, you sacrifice the time with your family. That sacrifice is the opportunity cost of your work. Students should understand that the total cost of college is greater than the calculated cost of attendance. They should also understand that, for example, the opportunity cost of spending lots of time in the local bar may be academic success.

Costs and Revenues: Total, Average, and Marginal

The cost of additional students is not the same as the overall cost per student.

Profit-making firms are interested in maximizing the difference between their revenues and their costs. Despite their primary mission of providing educational opportunities, non-profit colleges and universities must also pay considerable attention to managing both revenues and costs. Economists have some precise concepts which are useful in understanding the decisions colleges and universities face, both in terms of the optimal size of the student body and in terms of setting tuition and fee levels.

The concept of total cost is simplest. It refers to all of the institution's expenditures over a certain period of time, say an academic year. The economic concept of cost is different from the accounting concept in that it includes opportunity costs. A firm which is making a 1% rate of return on its investment will, for accounting purposes, have positive profits. But from an economic perspective, the opportunity cost of the invested funds — the return they could have generated in the best available alternative use — has to be taken into consideration. In economic terms, this firm is probably suffering losses, since its revenues do not cover its opportunity costs. Similarly, if a college enrolls 50 students to whom it grants tuition waivers, it does not actually shell out money to these students. But if these 50 students take the place of 50 paying students, then the tuition waivers constitute a very real cost.

Average cost is usually referred to as cost per student. If a university spends \$100 million a year to educate 5,000 students, the average cost of education is \$100 million/5,000, or \$20,000.

Does this mean that the college should not accept a student from whom it cannot collect \$20,000 of tuition, unless it is making a conscious decision to take a loss on the student in order to provide equal opportunity or diversify the student body or in some other way purchase some benefit? No. The relevant concept for making this decision is *marginal cost*. Marginal cost is the change in total cost which results from producing one more unit — in this case from enrolling one additional student. For colleges and universities, the marginal cost of additional students is usually very low — much lower than average cost. Once the classrooms and dormitories are built and the faculty hired, an extra student doesn't add much to the cost of operation. There is a limit to this of course. If the college decides to enroll an additional 200 students, it will probably have to hire additional personnel and expand facilities. But for most institutions, the marginal cost of a few additional students is quite low.

In order to determine whether the school's financial situation will improve with the enrollment of a student who pays say, \$3,000 in tuition, the relevant question is whether or not \$3,000 covers the *marginal cost* of educating the student. Does the student add more to revenues than she does to costs? If so, from a purely short-term financial perspective, the student should be enrolled. The same principle explains, for example, why airlines sell seats at low fares if they think they will not otherwise be filled. Once the plane is flying, the marginal cost of additional passengers is very low. Of course, if the total cost of flying an airliner with a capacity of 500 passengers is \$250,000, the airline will lose money if it doesn't charge an average of at least \$500 per person. But it makes sense to let an extra person come on board at the last minute even if he is willing to pay much less than this — just enough to cover food and any extra fuel cost resulting from the additional weight.

Marginal costs and benefits are also the relevant concepts for determining incentive effects. One place in the need analysis system where incentive effects are particularly important is with respect to savings. The need analysis system is frequently criticized for creating a savings disincentive because of the reality that the expected contribution is higher for families who have saved than for those who have similar incomes but no assets. Evaluating the savings disincentive involves determining the marginal tax rate on savings. Under current formulas, an extra dollar of savings would increase the expected contribution by a maximum of 5.6 cents. The question is whether a marginal tax rate of 5.6% is high enough to have any impact on savings behavior. A marginal tax rate of 95% would certainly discourage savings, but the existing marginal tax rate is low enough that families who save will clearly have an easier time making their expected contributions than those who must rely entirely on current income and borrowing; it is not obvious that it is high enough to have any measurable effect on behavior in the absence of misperceptions about the relationship between assets and expected contributions.

Market Structure: Competition vs. Monopoly Power

How much competition is there among institutions and how much monopoly power do colleges have?

Market structure refers to the degree of competition which exists among firms in an industry. At one end of the continuum are *perfectly competitive* industries with many small firms, none of which have a big enough share of the market to noticeably influence price. At the other end of the continuum are *monopolies*, markets in which one firm operates without competition. Firms in perfectly competitive industries sell products which are not readily distinguishable from the products of their competitors. Because it

is virtually impossible for them to differentiate their products from those of others, they cannot raise their prices above the "going" price without losing their customers. If existing firms in a perfectly competitive industry are making high profits, others will choose to enter the industry, which by definition is characterized by easy entry and exit. This means that high profits will not persist. New firms entering will try to break into the market by charging a slightly lower price. This process will continue until the product price just covers average costs of production, and profit rates are comparable to those available elsewhere in the economy. The market for eggs (in the absence of any government interference with prices) would be an example of perfect competition. The members of the egg industry have, at times, gotten together to advertise "the incredible edible egg" or to counter fears about eggs causing heart disease, because individual egg producers cannot succeed in making consumers think their eggs are any better than any other farmer's eggs. Prices of eggs tend to be fairly similar, since people are unlikely to pay significantly more for one brand than another.

Monopolistic competition resembles perfect competition in that it involves many small firms and a high degree of price competition. But in this sort of industry, firms are able to differentiate their products, either through brand identification or through slight differences in the characteristics of the product. Firms in monopolistic competition will be able to charge higher prices if they can create brand loyalty, but because there are close substitutes produced by competing firms, they, like firms in perfect competition, are not likely to maintain high profits over the long run. The clothing industry is monopolistically competitive. People are willing to pay higher prices for brand names, but there are many firms in the industry and new firms can easily enter to compete with existing firms.

If brand loyalty is so strong that the products of competing firms do not appear to consumers to be close substitutes, or if there are other barriers to entry, a small number of firms may dominate an industry, creating an *oligopoly*. A few firms can share the market, earning profit levels higher than those enjoyed by firms in more competitive

industries. The barriers to entry of new firms may involve significant capital costs, such as those involved in opening an automobile factory. They may simply involve advertising and consumer confidence. Breaking into the cola industry, for example, is no small feat, despite the relative ease of the production process itself. A variety of pricing patterns may appear in oligopolies, but prices are likely to be higher than they would be if the industry were less concentrated.

Finally, in a *monopoly*, where one firm captures the entire market, no close substitutes are available. Some monopolies exist because of economies of scale which make it inefficient for the market to be divided up. Historically, this was the logic behind the monopolies enjoyed by local telephone companies and utilities. Other monopolies exist because of more artificial barriers to entry, like patents. Monopolies can clearly charge higher prices than other types of firms, because they face no effective competition.

Few industries fit exactly into any one of these four market structures. Still, the models are useful in pointing out the relevance of competition and of monopoly power in understanding pricing and production policies. Price discrimination is an option only if firms have some degree of monopoly power, so that the customers being charged higher prices cannot turn to other firms for the same product. Price discrimination requires a downward sloping demand curve, whereas firms in perfectly competitive markets face horizontal demand curves. No consumers are willing to pay higher prices for the output of one producer when perfect substitutes are available from others. The prevalence of price discrimination in higher education implies that there must be some degree of monopoly power in the industry. That is, many colleges and universities have the "power" to raise prices without losing all potential customers.

It is easy to see that higher education is not perfectly competitive because the products offered by individual institutions are not perfect substitutes. There are very noticeable differences in the type and quality of education offered at different colleges and universities. Schools with national name recognition can charge higher tuition than less well-known institutions without losing all of their applicants. The number of

colleges and universities in the market suggests that the industry may be closer to monopolistic competition than to oligopoly. The answer to this depends, of course, on how the market is defined. It could be argued that in the state of Utah, where there are nine colleges and universities and about 80% of students attend in-state institutions, there is an effective oligopoly. A similar argument might be made about the Ivy League universities, since they may be perceived as a separate market from the other colleges and universities in the country.

The Justice Department investigation into tuition and financial aid policies of selective private colleges in the early 1990s suggested that these colleges have considerable monopoly power. The contention was that the colleges were colluding to set prices, a practice which is viable only in oligopolistic markets, with small numbers of firms which can carefully monitor each others' behavior, with considerable barriers to entry, and without close substitutes. This may be a reasonable description of certain segments of the higher education industry, like the two mentioned above, even though it clearly does not describe the industry as a whole.

However, one argument made by the Justice Department is flawed. It suggested that the small variation in tuition levels among selective private colleges was an indication of price fixing. In fact, in industries which are very competitive (like the egg industry), prices of all firms are likely to be similar. This is because each firm faces a very elastic demand curve and risks losing customers if it raises its price. These prices might be the result of competition rather than of collusion.

Whether or not the Justice Department was justified in its accusations and whether or not the cooperative financial aid practices were socially beneficial are complex questions with subjective components. But reaching an informed judgment on the matter depends on understanding what monopoly power is, why it might justify anti-trust policies, and what the conditions necessary for price-fixing are. Many colleges and universities have some monopoly power because of their distinct characters and reputations. Price-fixing is only viable if there is a small number of firms and none has the

incentive to violate the agreement. Firms with monopoly power are likely to charge higher prices and to limit output relative to firms in competitive industries, but the fact that there is minimal variation in prices across firms does not necessarily signal either monopoly power or price fixing.

Horizontal and Vertical Equity

There are some objective ways of looking at the complex and subjective idea of fairness.

Economists divide the concept of equity or fairness into two basic categories. *Horizontal equity* refers to the equal treatment of people in similar circumstances, while *vertical equity* involves treating people in different circumstances in appropriately different ways. All public expenditure and taxation policies can be examined both from the perspective of efficiency and from the perspectives of horizontal and vertical equity. These concepts are, of course, to a considerable degree, subjective; there is no definitive way to measure the equity of any particular policy.

The personal income tax provides a good example for examining issues of horizontal and vertical equity. Horizontal equity requires that people with equal incomes should pay equal amounts of tax. But the reality of designing an equitable policy is not so simple. Should *individuals* with equal incomes pay equal taxes, or should *households* with equal incomes pay equal taxes? Is a couple in which the husband earns \$60,000 a year and the wife works in the home in the same situation as a couple in which each spouse earns \$30,000 a year? Most economists argue that the source of the income is irrelevant and horizontal equity requires that all income be taxed at the same rate. Nonetheless, the income tax code allows breaks for capital gains income not available for wage income, and completely exempts income from certain sources from taxation.

The need analysis system faces similar complications relating to horizontal equity. It is easy to say that two families in similar circumstances should be judged to have the same ability to pay. But judging equal circumstances is not always straightforward.

For example, families with two children are assessed very different expected family contributions, depending on the spacing of their children. Those with twins may be expected to contribute only about half as much to their children's education as families with similar incomes and assets who have children four years apart. This is a *horizontal inequity*.

One of the most common horizontal equity quandaries in designing a need analysis system is determining whether or not families with similar incomes who have, for a variety of reasons, made different choices, should be treated similarly. If two families have equal incomes, but one has chosen to save while the other has chosen to consume more, should they have equal expected family contributions because they had equal opportunities, or should the family with savings pay more because their accumulated savings increase their capacity to pay?

Vertical equity is even harder to identify than horizontal equity because there is considerable room for disagreement on defining the types of differences in circumstances which should correspond to different treatments and because there is not one right answer to how different the treatments should be. We have a progressive federal income tax, under which those with higher incomes pay a higher percentage of their income in tax than do those with lower incomes, because there is a general sense that this constitutes appropriately different treatment of people in different circumstances. But extensive efforts by many great minds have been unable to produce a *proof* that a progressive tax is fair, much less any objective standard for the optimal degree of progressivity.

The need analysis system, like the federal income tax, uses a graduated rate structure, combined with the exemption of some amount of income, in order to create a progressive tax system. There is no way to determine, however, whether the existing rate structure is more vertically equitable than any alternative rate structure would be. This is a judgment on which reasonable people will always differ.

Despite the difficulty of ranking specific policies and practices in terms of horizontal and vertical equity, these concepts provide very useful benchmarks for designing and evaluating policies. The fact that we are likely to disagree on optimal strategies does

not negate the fact that a good need analysis system will be designed, as far as possible, to assess equal contributions from families and students in similar circumstances and appropriately higher contributions from those with greater financial capacity.

Human Capital

Education is an investment which increases students' productive capacity and earning power over their lifetimes.

The term *capital* has a somewhat different meaning in economics than in common parlance. Capital refers to goods which have been produced in order to aid in the production of other goods and services. Capital and labor are the major categories of inputs into the production process. Labor is more productive than it otherwise would be because it works together with capital. People can produce more goods and services in a given amount of time because of the fact that they have machines with which to work.

Increases in productivity (output per work hour) in the economy over time are attributable not just to increases in the capital stock and improvements in technology, but also to increases in workers' skill and knowledge levels. It is not just machinery or physical capital which increases the productivity of labor, it is also education and training. This education and training increases *human capital* - the qualities embodied in human beings which increase their ability to create goods and services.

Human capital theory helps to explain wage differentials. People with higher skill levels tend to earn higher wages because they are able to produce more than people with lower skill levels. Empirical studies reveal clearly that people with more years of education, training and labor force experience command higher wages. These higher wages constitute the return to the acquisition of human capital.

Because a college education increases human capital and thus earnings potential, it is an investment whose rate of return can be measured. The price of the education can be compared to the increased earnings over a student's lifetime. The more a

college education increases earnings potential, the more students should be willing to pay for that education. In other words, an understanding of human capital, of the role of education in increasing an individual's human capital, and of the role of human capital in determining earnings can help people to evaluate what is a reasonable amount to pay for education.

The idea of education as an investment which pays off over a lifetime also makes it much easier to explain why it is logical to save and to borrow to finance higher education. The concept of borrowing to finance investments in physical capital is well-established. Few people would think it advisable to avoid all capital investments unless they have the savings necessary to buy the plant and equipment they need to operate a business. They understand that the loans can be paid off through the revenues generated by the capital investment. This same reasoning can be applied to the investment in human capital.

Externalities: The Spillover of Benefits

Individual students are not the only people who benefit from education. Society as a whole benefits from a more educated populace.

Private markets will lead to inefficient outcomes if markets are not perfect. Market failures exist when there are departures from the conditions required for perfect competition. One example is that of *externalities*, which exist when transactions between consumers and producers have an effect on third parties not accounted for by the market. The most common example of an externality is environmental pollution. Markets overproduce pollution because in the absence of property rights for air and water, firms do not view the destruction of these common resources as constituting a cost of production. They tend not to account for environmental degradation when making profit-maximizing decisions. The *social cost* of production exceeds the *private cost* of production.

If the *social benefit* of the consumption of a commodity is greater than the *private benefit*, there is a *positive externality*. The idea that there are significant positive externalities in elementary and secondary education is rarely debated. A literate citizenry is prerequisite to the functioning of a democracy and the skilled work force fundamental to economic development depends on universal education. The positive externalities of higher education are smaller and more elusive. But to argue that there are no externalities, one would have to accept the unlikely idea that the entire increase in productivity resulting from higher education is reflected in wages. In fact, better educated students are more likely to engage in professional activities with significant social benefits not fully compensated by the market.

Even when high productivity levels are accompanied by commensurate individual financial rewards, the rest of society benefits from innovations and contributions. We are all affected not only by the level and quality of our own educations, but by those of the people around us who can communicate and work more effectively if they are well-educated. A worker's productivity is likely to be higher if his co-workers are more productive. Moreover, even if there is no shortage of, for example, scientists, if the best potential scientists are unable to enter the field because of financial constraints, society is poorer than it needs to be.

The existence of positive externalities is frequently cited as an argument for government subsidy of education. People will pay for education only to the extent that they themselves enjoy the benefits. If a significant portion of the benefits accrue to society at large, people will choose to consume less than the "socially optimal" amount of education in the absence of subsidies. From an institutional perspective, it may also be useful to think about the externalities resulting from subsidizing particular students. For example, grants to students designed to increase diversity will certainly provide benefits primarily to the students whose education is subsidized. However, the presence of students

from different backgrounds on campus may also create *positive externalities*, enhancing the educational experiences of students other than the direct beneficiaries of the grants. The same argument may be made about merit-based aid which succeeds in enhancing an institution's intellectual environment.

Incomplete Information

Students may not know in advance exactly how much a college education will be worth to them. Another type of market failure exists if consumers do not have complete information about the products available to them. If consumer information is imperfect, markets are less efficient than they otherwise would be. Consumers will not always gravitate to the lowest-cost producer for equivalent products, nor will they be able to accurately weigh the costs and benefits of their purchases.

Standard examples of market failure involving incomplete information include markets for medical care, where consumers must rely on suppliers for information about the need for services and the quality of those services. In the case of higher education, there are several related problems. The consumers are often young people. They have no experience with higher education and may under-estimate its value. Their desire for immediate gratification and under-valuing of future benefits may cause young people to choose the job market (or a life of leisure) over human capital investment, even if this choice is inefficient in the long-run.

Consumption vs. Investment Goods

The benefits of education last longer than the college years; they last for a lifetime.

Consumption goods are purchased and consumed because of the utility they directly provide. We buy apples because we enjoy eating them and we go on vacations in order to relax. While the consumption of these goods may have some long-term effects, their primary impact is immediate. Investment goods are intermediate goods. They do not provide utility in and of themselves, but increase opportunities for future production and consumption. Firms invest in machines in order to increase their future productivity. The investment frequently involves postponing production or postponing profit streams.

Residential housing and consumer durables are a form of investment expenditures which provide a stream of consumption over time. No one buys a car with the idea that they will get \$20,000 worth of utility from the car in the year of its purchase. Borrowing to pay for a car seems reasonable because the car will provide benefits over time. Loans for home purchase are longer term than those for car purchase because the home provides benefits long after a car purchased at the same time has been reduced to scrap.

College has elements of both consumption and investment. College is an investment in human capital and to the extent that it increases future earnings potential, it is an investment which can reasonably be paid for over time. Nonetheless, there is a consumption component to college, since students gain personal satisfaction from their studies and may well enjoy the student lifestyle.

The distinction between consumption and investment is very important in terms of college. It has implications for financing strategies; it makes it obvious that insisting on paying for college out of current income, when the benefits extend over a lifetime, is not rational.

Merit Goods

There is a general consensus that the opportunity for higher education should be available to all, regardless of ability to pay.

It is a long-standing notion that the fundamental value of equal opportunity in our society requires that access to higher education not be limited by ability-to-pay. It is not "fair" that bright and motivated students should be unable to further their educations simply because their families cannot afford to pay. This suggests that we think of higher education as a *merit good* — one to which all members of society should have access. The specification of merit goods is dependent on social and historical circumstances and may be controversial. But economic reality and the current structure of the labor market make it difficult to argue that access to higher education should not be a merit good in our society. Average monthly income for college graduates is almost twice that for high school graduates and the gap is growing. The unemployment rate of college graduates is about half that of the total labor force. Denying access to higher education is tantamount to denying access to economic success.

The idea of higher education as a merit good creates a strong argument for public need-based financial aid. It may also be a significant determinant of institutional decisions to use need as the primary criterion for distributing subsidies to students.

Models of the Firm and Higher Education Institutions

Colleges provide goods and services to consumers, just as other firms do, but they are unique in a variety of ways.

This discussion of the application of economic principles to financial aid and higher education pricing does not necessarily imply that the standard economic models of the firm and of the behavior of producers and consumers can be applied unmodified to higher

education institutions. While it is useful to think of colleges and universities as firms providing a product, of faculty and staff as inputs into a production process, and of students as utility-maximizing consumers, there are also some dangers to this approach. The issue is not that it demeans the quality or importance of education to think of it as a commodity. Rather, the conditions of production and consumption of higher education are, in some ways, unique. Ignoring this uniqueness can lead to some short-sighted decisions in the supposed interest of efficiency.

One unusual characteristic of educational institutions is that the consumers are a critical input into the production process. This is true in the sense that education is not something that automatically provides benefits to anyone who purchases it. Considerable time and effort on the part of the consumer are required. No level of "quality product" can guarantee that the consumer will get the benefit he anticipated. This means that the provider has much less control over consumer satisfaction than is the case with most products.

Moreover, the quality of the product for each consumer depends on who else is purchasing the product. No matter what the efforts of faculty and staff, no matter how extensive the facilities, no college or university can produce quality education without quality students. Each student's educational experience is dramatically affected by the other students in the classroom. For this reason, colleges and universities are not generally willing to sell their product to everyone who is willing to pay. If they did this, they would end up with a deteriorating product. There are few firms in other industries which turn away customers who are willing to pay because they don't meet the "admission standards." But if colleges having trouble filling their classes forget about the impact the composition of the student body has on the quality of their product, they are in danger of losing their ability to deliver quality education.

Another unusual characteristic of education is that consumers generally do not fully appreciate the value of the product until after they have consumed it. An understanding of what education can do for one's life (other than increasing earnings) is likely

to develop over the lifetime of the student. It is certainly not likely to exist among 18 year old high school graduates.

This phenomenon has significant implications for how educational institutions respond to consumer demand. For profit-maximizing firms in most industries, monitoring consumer preferences is vital and modifying products in accord with changing tastes is important for survival. While educational institutions clearly have to be responsive to consumer demand in order to survive, if colleges go too far along this path they may be at risk of failing to deliver the product which defines their mission. The familiar questions of whether students should take required courses and whether colleges should continue to offer relatively unpopular programs with intellectual justification are related to this phenomenon. There is some danger in the current market for higher education that more and more institutions will cater to the short-run vocational training demands of students. While these demands certainly need to be met, and while some institutions may perceive changing in this direction as the only means of survival, in the end, people are not likely to pay the high price of education for simple training. And liberal education, which may have significant social value, will be allowed to disappear because 18 year olds don't understand its import.

This situation is complicated by two other unique characteristics of the higher education market. One is the prevalence of third-party payers. The reality is that despite the increasing prevalence of student loans, most students benefit from some combination of parental contributions, government subsidies, and institutional aid. This means that willingness to pay is not merely a matter of the individual consumer's attitude toward education. Educational institutions must market themselves to parents as well as students. This may ease the problem that young people don't fully appreciate the benefits, in the case of parents with resources. It also means that many students who themselves would not be willing to pay the full price will attend — clearly a necessity for the viability of many institutions in the current market.

Finally, higher education is a product most people purchase only once. No matter how satisfied they are with their college educations, the most people can do is recommend the school to family members or friends. Educational institutions are forced to spend considerable resources on consumers who have virtually no chance of being repeat customers. While some of these expenditures create attributes which improve reputation and draw in future students, others affect only current students.

These characteristics of the market do not mean that general economic principles do not apply. But they do mean that those making financial decisions at colleges and universities should think carefully about the uniqueness of their market and about the position of their particular institution within that market. The principles behind the demand for higher education and the determination of ability to pay have general applicability. But how the understanding of ability to pay is used to determine policy is a complex issue, with different answers appropriate in different circumstances.

PART II:

Need Analysis Methodology

The economic principles explained in the preceding section can provide a foundation for the design of need analysis and for the evaluation of existing practices. They do not, however, dictate one specific set of criteria which should be used for ranking students and families or for determining precise levels of ability to pay. There is no absolute standard against which a need analysis methodology can be measured and many of the judgments involved in constructing a methodology are subjective. Nonetheless, it is useful to examine aspects of current practices and potential modifications to these practices for their consistency with economic principles.

The discussion which follows focuses on the fundamental components which underlie any formula determining ability to pay. It also analyzes the economic rationale for particular aspects of current need analysis methodologies and suggests some perspectives which might strengthen the economic soundness of the systems for determining need. Not every issue discussed is relevant for every institution, since different institutions with different mandates, different resources and different student bodies face a wide variety of problems and options. Most important is that there is a way of thinking about need analysis which incorporates economic reasoning. Aid administrators who have thought about the issues included here from this perspective will be better able to apply the framework to the particular questions confronting them.

This discussion will not attempt to answer all of the imponderable questions faced by financial aid administrators. The starting point is, in fact, acceptance of the reality that reasonable and thoughtful people will always disagree on the precise components of a need analysis system. But an understanding of the fundamental economic principles underlying the determination of ability to pay and the design of a need analysis system should help us to gain a common perspective on the key elements of the system and on the areas in which compromise makes sense.

Defining Necessities

Even if we could agree on a clear ranking of aid applicants, assuring vertical equity in the distribution of funds, the precise amount of the expected contribution would have a significant arbitrary component. It is tempting to argue that there is a certain amount required for necessities and that we should be able to agree on a percentage of discretionary income to be devoted to paying for education. But defining necessities is not simple. Clearly everyone needs basic food, clothing and shelter. But how many families contemplating higher education for their children really define necessities so narrowly? Is owning a television set a necessity? Is buying new sneakers when the old ones begin to tear a necessity? Is ordering pizza occasionally a luxury which we should expect families to sacrifice? What about a second car?

An interesting aspect of the subjective nature of necessities is that people accustomed to higher living standards define necessities more broadly than do those living under severe financial constraints. If we allowed actual expenditures on food, clothing and shelter to constitute necessities, we would end up providing much more generous allowances to wealthier families. This would obviously be an untenable foundation for a need analysis system. On the other hand, there are some ways in which absolute necessities *do* expand with living standards. Minimum wage workers are rarely expected to show up in designer suits. For corporate executives, on the other hand, wearing the correct clothing can make the difference between success and failure.

The impossibility of precisely defining necessities is sufficient to make the determination of need subjective. But the difficulty of ranking people according to capacity to pay is an even more serious impediment to constructing the optimal need analysis system. We have equivalency scales to approximate the difference family size makes in living standards, but they are clearly imprecise. Among other problems, they do not adequately differentiate between, for example, families with two adults and one child and

those with one adult and two children. Geographical differences in the cost of living present another problem. While regional adjustments might be possible, also correcting for the urban/rural/suburban differences which vary across the country would add considerable complexity.

Moreover, it is not obvious which circumstances should be considered as affecting ability to pay. Does a two-earner family have the same options as a one-earner family with a similar income? How does the status of a family which owns its own home but has high mortgage interest payments compare to the status of a family which rents? How do liquid and non-liquid assets affect a family's ability to finance college? Perhaps the most difficult question is whether and how the decisions a family has made in the past about saving and spending should affect our view of them as they enter the need analysis system.

Both income and assets contribute to financial strength and therefore to the ability to pay for college. The discussion below separates these two factors to examine their contribution to ability to pay, both from a theoretical perspective and from the perspective of need analysis methodologies. Alternative definitions of income are discussed and the exemptions from income used to determine expected family contributions are analyzed. The same approach is taken for assets. The last step is to examine the tax rates applied to income and assets in the need analysis system. Before addressing these specific components of the need analysis system, the fundamental question of whether expected contributions should be based only on a current snapshot of the household's financial circumstances, or whether a longer-term approach should be taken is addressed.

Snapshot vs. Long-term Financial Capacity

At its inception, need analysis was grounded in several basic principles. One was the idea that aid applicants should be taken as they appear at the time of application. In other words, a family's past options and choices should not be taken into consideration or judged. The need analysis system would simply look at the applicants' current income and assets and determine the amount they were able to pay in the year. This view became deeply ingrained in the financial aid profession, but has been brought into question in recent years by the focus on education as an investment and the recognition that few families can afford to pay for college without planning over time, saving and borrowing.

The logic behind the "snapshot" approach is both pragmatic and philosophical. The purpose of the aid system is to allow potential students who do not have adequate financial resources available to attend college. Punishing students whose parents chose to travel extensively and buy expensive cars instead of saving for college would violate the principle of providing access to all regardless of ability to pay. Moreover, from a practical perspective, no amount of reprimanding or denial of aid can make a family change its past behavior, so denying aid because of poor planning will simply deny access, it will not change behavior.

But the arguments against this principle appear much stronger, now that the cost of college is significantly higher relative to family incomes than it was at the time the original methodology was devised. It is clear to anyone comparing expected family contributions to incomes that few families will be able to pay these contributions out of current income and liquid assets. Economists studying the need analysis system have consistently argued that thinking of expected contributions as relating to current income is illogical. Education is an investment in human capital, not a consumption good like restaurant meals and trips to Disney World. Education provides students with benefits which will last over their entire lives. While some of the most important benefits are non-pecuniary, it is very clear that a college education significantly increases expected

future earnings. Just as businesses expect to borrow to finance capital investments, but see accumulating debt to meet the payroll as a sign of significant financial distress, it is quite reasonable for parents and students to borrow to pay for college, even if they are wise enough not to run up credit card bills for entertainment purposes.

For parents, who know well in advance that their children will be graduating from high school and contemplating college, saving over time for higher education is clearly a wise decision. There is no good argument for cutting deeply into consumption expenditures for the four years a child is in college in order to live at a much higher standard for the ten years preceding and following college.

This concept is well established as the "life-cycle" model and the "permanent income" hypothesis in economics. The idea is that people even out their consumption over the long run more than they are able to even out their incomes. Young people who are getting an education or who are just starting out in the labor force and have young children tend to spend more than they earn. The same is true for retirees. But in the middle years, people at the peak of their earnings cycles should be able to save in order to pay back debts acquired earlier and prepare for retirement.

There is evidence that people react differently to one-time windfalls than to permanent increases in income. The former simply does not allow the same change in standard of living enabled by the latter. Similar reasoning would suggest that if a major expense is looming — such as financing four years of college — people who are able to will react by cutting consumption by a fraction every year for a long period of time, rather than experiencing a significant temporary decline in their standard of living for four years.

The implications of this theory are somewhat different for independent students financing their own educations. Here the theory suggests that these students may live at a higher standard of living while they are in college than they would if they anticipated that their current low incomes would persist throughout their lives. In other words, borrowing while in school in order to be able to eat out occasionally may

not be as irrational as it appears at first glance, if a student living on \$10,000 a year anticipates a long-term income of \$70,000 a year.

Given the reality that education is an investment with long-term benefits and one that can and should be anticipated and planned for, the idea that a narrowly-defined snapshot view is relevant is not satisfactory from an economic perspective. Economic theory suggests that modifying the current need analysis system so that it would not depend on the idea that families should be "taken as they are" could diminish the savings disincentive problem (discussed in detail below). It would help to encourage families and students to think of education as an investment which must be paid for over time.

Incorporating the idea that families pay over time does not necessarily mean abandoning the reliance on current income and asset data to calculate expected contributions. While past income may be relevant, the idea of collecting data on past income is not a practical one given current bureaucratic constraints. Predicting future income will always depend on current information.

It might, however, be possible to give more weight to past and future educational needs and to incorporate assumptions about long-term income and savings options. The practical implications of these ideas are discussed below in the sections on taxing savings, the ideas of educational income and savings protection allowances, and the treatment of multiple siblings.

Defining Living Standards

The need analysis system relies on benchmark income levels to set several of the allowances against income and assets. For example, the Income Protection Allowance is based on an income level below which a household is assumed to have no discretionary income and the Asset Protection Allowance is designed to allow a reasonable living standard for retired people.

Two different sources of data are used to determine these income benchmarks. The Federal Methodology (FM) relies on the Bureau of Labor Statistics family budget levels, which were also the foundation of the Uniform Methodology and until 1993, the College Board's Institutional Methodology. These standards are based on a combination of expert judgments about required food and shelter consumption, actual family consumption patterns in the mid-1960's, and statistical analysis. The BLS developed a *lower budget level*, an *intermediate budget level*, and a *higher budget level* in the mid-1960's and these levels are updated annually for changes in the Consumer Price Index.

Institutional Methodology (IM) relies instead on the Consumer Expenditure Survey (CES), an on-going survey of total household consumption expenditures conducted by the Bureau of the Census for the Bureau of Labor Statistics. The CES involves both diaries completed by participating consumers and interviews. Average consumption expenditures in the CES are affected both by price changes and by changes in consumption patterns resulting from changes in tastes, habits and lifestyles, the availability of new products, and changes in the relative prices of goods and services. In other words, CES living standards are more reflective of current consumption patterns than are BLS living standards.

The income benchmarks in the IM are four budget levels emerging from analysis of the CES data. The *prevailing family standard* is set at the median expenditure level of all households composed of a married couple and two children. The other standards are fixed relative to this level, with the *social minimum standard* equal to one half the prevailing family standard, the *lower living standard* equal to two-thirds of the prevailing family standard, and the *social abundance standard* fifty percent higher than the prevailing family standard.

Treatment of Multiple Children in College

As a direct result of the snapshot approach incorporated into the need analysis system since its inception, the current practice is to calculate the amount a family can be expected to pay and then to divide that amount over the number of students in the family. The logic here is that need analysis should determine the amount the family can reasonably be expected to pay in a given year and therefore, asking them for more would be unreasonable. Many aid administrators also believe that dividing the expected parental contribution by the number in college makes the system easier to explain to families.

This practice, however, results in a serious horizontal inequity. The spacing of a family's children has a dramatic effect on the total cost of educating those children. A family with twins going through four years of college simultaneously will end up paying a total of four parental contributions (PCs). A family with two children four years apart will pay a total of eight PCs.

This outcome becomes less reasonable if we think of higher education as an investment to be paid for over time. If the need analysis evaluation were really meant to be a proxy for long-term financial strength, it would not be logical to assess these two families so differently. Both families will be financing education over a period of time much longer than the college years, and the burden for the two should be similar. If the family with twins paid for one child out of current income and assets and borrowed to finance the twin, repaying the loan over the four years after graduation would make its situation similar to that of the family with children four years apart.

Many people believe that while families with two children in college should be expected to make larger contributions than similar families with one child in college, the contribution should be less than twice as large. There is, unfortunately, no precise way to calculate what the appropriate ratio is. This debate is likely to continue for the foreseeable future and while the principle of horizontal equity dictates a change from current practices, it does not provide a perfect solution.

Another way in which it might be reasonable for the need analysis system to take account of the number of children a family has the responsibility for educating would be to make an allowance for saving for future educational expenditures in addition to financing expected contributions for children currently in college.

The need analysis methodology could support planning and saving by explicitly allowing a deduction from income for a minimum annual savings expectation. Since the more children a family has to educate in the future, the greater the portion of their income they should be saving, this allowance against income might be linked to the number of children in the family. This type of income protection for savings would be a clear step toward using long-term financial capacity as a foundation for need analysis.

Defining Income

The standard economic definition of income is straightforward and comprehensive. Income over any period of time is the sum of consumption and change in net worth. Cash coming into the household can either be spent on consumption, saved, or used to reduce debt. Non-cash benefits including in-kind transfers such as food stamps, benefits like health insurance coverage, and accrued capital gains on real and financial assets also constitute income.

This concept of income, while theoretically simple, is very difficult to measure in practice and almost impossible to tax. The federal personal income tax system defines income quite differently. Adjusted gross income (AGI) includes cash income from many, but not all sources. It excludes, for example, the interest on municipal bonds, part of Social Security income, and other categories of government transfers such as AFDC. Non-realized capital gains and in-kind transfers and benefits are not included. Subtractions from gross income allowed to calculate adjusted gross income include employee business expenses, contributions to certain retirement plans, penalties for early

withdrawal of saving, alimony paid, and business losses. Exemptions and deductions are applied to AGI to determine taxable income.

The need analysis system uses AGI as a base for determining income, since this is the easiest amount for families and individuals to report and the easiest number to verify. However, all of the established methodologies have consistently modified this definition by also including untaxed income from Social Security, AFDC, child support and other sources.

Like the income tax system, the need analysis system is based on annual income. Because parental contributions generally require saving and/or borrowing over an extended period of time, economic reasoning would suggest basing the contributions on income over a period of time longer than one year. However, data collection, administrative and verification difficulties currently make this an infeasible option.

Whose Income Is Relevant?

Some students are considered by the need analysis system to be responsible for financing their own educations, while others are required to use both their own resources and the resources of their parents. The question of who should be considered *independent* and who should be considered *dependent* for the purposes of determining ability to pay is one that has always been a point of contention. Students have the incentive to declare themselves independent if at all possible, since this significantly increases their eligibility for financial aid.

Prior to the 1986 Reauthorization of the Higher Education Amendments, the definition of independence was based on whether or not students resided with their parents and the amount of support they received from their parents, in addition to whether or not they were claimed as dependents on the parents' income taxes. The 1986 modifications eliminated the first two criteria, but declared anyone who received more than

\$4,000 of income from a source other than parents to be independent. Like the earlier definition of independence, this criterion allowed students whose parents could and did subsidize their educations to receive aid which could otherwise have been directed to students who were truly on their own.

The current definition of independence is simpler. Graduate and professional students, married students, veterans, orphans, wards of the court, individuals with legal dependents, and students over the age of 24 are automatically considered independent. Other students are considered dependent unless determined otherwise through professional judgment. This definition of independence is a considerable improvement in the sense that it reduces the opportunities for students to alter or misrepresent their behavior in order to become eligible for additional aid.

For students who are either dependent on their parents or are married, the income of other family members is considered in determining ability to pay. Income is, however, taxed at different rates depending on who earns it. The income of parents of dependent students is taxed at marginal rates ranging from 22% to 47%, after deductions for taxes paid and an income protection allowance. The income of dependent students and independent students without dependents is taxed at the higher rate of 50%. The logic behind this distinction is that students' primary responsibility is to pay for their education, whereas parents have other responsibilities and are also not the primary beneficiaries of the investment in education.

The distinction between parent and student income is reasonable but not the only viable approach. For many families, especially those with low incomes, children's income supplements parents' income to fund general family expenses. Under these circumstances it would make more sense to tax family income as a whole.

Perhaps a more serious question about whose income is relevant is the one relating to divorced and separated parents. Under Federal Methodology, the income of the non-custodial parent is not considered. Institutional Methodology does allow for the incomes of both natural parents to be considered, but the question of how to treat non-

custodial parents and the spouses of custodial parents is one to which there are almost as many answers as there are financial aid offices. Economic reasoning cannot solve this social and ethical dilemma, but it can focus attention on the possible incentive effects of various practices. Affluent parents should not be able to reduce their responsibilities by getting divorced, so the FM solution of ignoring the non-custodial parent would seem to be the least efficient. Taxing the income of step-parents creates a disincentive for remarriage. On the other hand, ignoring that income may seriously under-estimate the financial resources available to some students.

Overall, the questions of whose income should be considered in determining family contributions and whether incomes of different people should be taxed at different rates have no clear answers. But they should be considered carefully and answered not merely from the perspective of administrative convenience, but also from the perspective of horizontal equity and behavioral incentives.

Allowances Against Income

Income Protection Allowance

Both aid administrators and parents frequently complain that the Income Protection Allowance (IPA) is too low because it is not enough for the family to live on. In fact, the need analysis system does not in any way incorporate the idea that the IPA is the family's living allowance. Instead, the idea is that up to the level of the IPA, a family's income is so low that it has virtually no discretion about how to spend its money. No one expects families to spend all of their money above the level of the IPA on college. Rather, some fraction of additional dollars should be devoted to college.

The IPA in the Federal Methodology is based on the BLS lower living standard and is updated every year for changes in the Consumer Price Index. The IPA in the College Board's Institutional Methodology is slightly different because it is based on data

from the Consumer Expenditure Survey which, as explained above, is based on current family expenditure patterns, which change from year to year both because of price changes and because of changes in consumption patterns. It is set at the lower living standard, which is two-thirds of median family expenditures, as reported in the Consumer Expenditure Survey.

There is no way to tell a family exactly how it should be spending its money. What one family considers a luxury may be a necessity to another family. But families with higher incomes are able to make more choices about spending patterns. The need analysis system simply requires that for families sending children to college, paying for education should be prominent among those choices.

Taxes Paid

The Federal Methodology specifies the percentage of total income to be deducted from the income of applicants in each state and territory to account for state and local taxes paid. There is one set of rates for all dependent students and independent students with no dependents. Higher allowances are provided for parents of dependent students and independent students with dependents, with the amount 1% higher for those with incomes below \$15,000 because of the acknowledged regressivity of state tax patterns. Sales taxes are regressive, requiring a larger portion of income from lower income people than from higher income people, because consumption rises relative to income as income declines. The distribution of the burden of property taxes is more complex and controversial, but these taxes are generally believed to be somewhat regressive. State income taxes are not progressive enough to compensate for the regressivity of other state and local taxes. The FM allowances were originally drawn from Internal Revenue Service data on state tax payments.

The state tax tables in the IM have recently been revised and now differ considerably from those in FM, which no longer include sales taxes. Most of the rates in the IM table are higher and there are different rates for five income categories of parents of

dependents students and independent students with dependents and for two income categories of dependent students and independent students with no dependents. These rates are based on a 1991 analysis of state and local tax burdens by Citizens for Tax Justice, a private research organization. This study indicated that the tax rates are higher and more regressive than the FM tables suggest. The rates for dependent students and independent students without dependents include only income taxes since sales taxes are accounted for in the student expense budget and most of these students are not property-owners.

Defining Assets

Both income and assets contribute to a household's financial strength. Income is a flow of dollars coming into the household over a particular period of time. Assets are the stock of resources which have been accumulated over time. Households with higher incomes are likely to have an easier time accumulating assets because they may be able to save more. Nonetheless, the correlation between income and assets among households is far from perfect. About one-sixth of the filers in the lowest income quarter of 1995-96 College Scholarship Service (CSS) filers fall into the highest 30% according to net worth. About 30% of the filers in the highest fifth according to income fall into the lowest third according to assets.

Some of the households with low incomes and large assets are undergoing temporarily difficult experiences such as unemployment; some are retired; some are small business owners with cash flow problems; but others are affluent people who, for tax purposes (or for the purpose of manipulating the student aid system) are able to disguise their incomes. Part of this discrepancy is because of the difficulty involved in defining and measuring income. The incomplete definition of income under the federal income tax system creates incentives for people to convert their income into forms which escape taxation.

Households with high incomes and low asset levels may have had a recent large increase in income; they may have faced unusual circumstances, such as special needs children or high medical expenditures which have prevented them from saving or have depleted their assets. But they may also simply have made lifestyle choices leading to high ratios of current consumption relative to planning for the future.

Assets take a variety of forms and only a fraction of them are recognized by the need analysis system. There are several possible ways to categorize assets. One is according to *liquidity*, or the ease with which assets can be converted into cash and spent. A bank account is the most liquid asset other than cash. A Certificate of Deposit which can only be cashed in after a certain period of time or with a penalty is less liquid. Home equity, the form taken by the largest portion of the assets of financial aid applicants, is a non-liquid asset which has been rendered more liquid by the ease of obtaining home equity loans and lines of credit. Other non-liquid assets have to be sold in order to generate cash; they frequently have limited markets and are difficult to value. It is hard to imagine a need analysis system which would take the value of a family's automobiles or rare artwork into consideration, despite the fact that they are indicators of both standard of living and financial capacity.

There is a fundamental problem with treating different forms of assets differently. As long as people have choices about the form in which to hold their assets, differential treatment will create incentives for people to alter their asset holdings in response to the need analysis system. The current Federal Methodology does not take home equity into account. This means that a family can reduce its expected contribution by taking savings out of the bank and using the funds to pay off part of its mortgage.

This raises a number of problems. One is a horizontal equity problem. Two families in identical economic circumstances will be treated differently by the need analysis system depending on whether or not they choose to change the form of their assets. In addition, families will make decisions based not on rational long-term benefits, but on the incentives generated by a distorting need analysis system.

As long as we tax one form of assets and not another, we have a system with a horizontal inequity. We are providing the opportunity for people to manipulate the system and misdirect limited funds away from those with true need and in the direction of those savvy enough to make themselves look needy.

The questions of the extent to which assets contribute to ability to pay and whether or not different types of assets should be treated differently have been on-going issues in the need analysis system. Current practices vary widely. Federal Methodology ignores all assets for many families with incomes under \$50,000; home equity and family farm assets are excluded for all filers. The College Board's Institutional Methodology taxes a much broader base of assets. It does not use income level as a determinant, but considers assets for all filers. It includes both liquid and non-liquid assets, with an optional adjustment for home equity (discussed below).

Two very different philosophies underlie these two approaches. FM relies on the principle that home equity and family farms are non-liquid assets and taxing them would require families to disrupt their lifestyles in unacceptable ways in order to finance college. It also assumes that families with low and moderate incomes either do not have significant assets — and therefore there is little benefit to having those assets reported — or cannot afford to tap those assets because of their low current incomes.

Methodologies which pay more attention to assets rest on the principle that assets and income contribute independently to financial strength. This approach, aside from its solid grounding in economic realities, eases the allocation of limited resources. When FM was modified to treat assets more generously, significant amounts of additional need were generated. Families previously ineligible for aid because of their home equity, for example, suddenly became eligible for large subsidies, although generally only loans are available to meet this need. The modification to the methodology made it difficult for either the government or institutions to distinguish among families in quite different circumstances in order to allocate the resources which are far from sufficient to meet all of the newly defined need.

A problem closely related to the differential treatment of different forms of assets is the way debt affects the system's measurement of assets. If a family uses a home equity loan, its assets decrease by the amount of the debt, so any expected contribution based on assets will decline. On the other hand, if they borrow in another way, say through a PLUS loan, their assets do not decrease and they are assessed as though they did not have debt. From an economic perspective, taxing net worth, rather than measuring assets but disregarding debt, would be logical and horizontally equitable. Using net worth as a basis for calculating expected contributions would require collecting the kind of information which is generally gathered on loan applications. This approach would involve a significant departure from current practices and is not likely to be adopted in the foreseeable future.

Whose Assets Are Relevant?

The same questions which apply to the treatment of the incomes of various members of the household and family apply to the treatment of assets. Under the current system, parental assets are taxed at a maximum rate of 5.6% per year, while student assets are taxed at 35%. Again, the logic is that parents have other demands on their assets, while students should make paying for education their first priority.

It is widely recognized that the differential treatment of student and parent assets has created fertile ground for financial advisors. The ease of transferring assets from one family member to another interferes with the logical grounding for this need analysis provision. The difficulty of making a meaningful separation of the assets held by different family members also brings into question the practice of ignoring assets held in the names of siblings. An alternative to the current approach which might solve these problems would be to collect data on assets held by all family members and tax them all at the same rate. While it might create some new problems, this would eliminate the horizontal inequity based on the arbitrariness of the names on many savings vehicles.

The Tax on Savings

One clear effect of the snapshot view on which the need analysis system has historically rested is that families who have chosen to save for college end up having to pay more than those who have not. The idea that assets increase ability to pay collides with the idea that families should be free to choose whether to save in advance, to cut deeply into current consumption, or to borrow. Two families with identical income histories should, according to principles of horizontal equity, be asked for identical contributions (at least if they are choosing equally priced educational options). But taxing the frugal families' savings means that they will lose out on some financial aid.

There is of course no perfect answer to this dilemma. Currently, both the Federal Methodology and the College Board's Institutional Methodology tax assets exceeding the Asset Protection Allowance by adding 12% of the value of those assets to available income. This creates a maximum tax on assets of 5.6%, given the maximum tax rate of 47% on income. Financial aid administrators tend to focus on the fact that a family with \$10,000 of college savings will pay a maximum of \$560 more than a similar family with no savings. The family with the \$10,000 will have a much easier time financing their expected contribution and will, in the long run, be better off than the family which depends on borrowing and suffers the effects of compounding interest.

But there is a clear perception among the public that savers are chasing a moving target. Every dollar they save in an attempt to be prepared for the daunting expected contributions they face increases the amount colleges will expect them to contribute. Economists also complain about the savings disincentive in the need analysis system. The combined effects of the income tax system and the need analysis system on the marginal tax rates on income and on savings may discourage significant amounts of saving. A family which chooses to save may pay 28% of the interest in income taxes and then another 47% of the after-tax interest in increased contribution from income. \$100 in interest income would then generate only \$38 to help pay the basic contribution.

The need analysis system taxes both the interest generated by assets and the accumulated asset. The contribution expected over four years of college would increase by about 20% of the amount originally saved. This means that a family which had saved the anticipated amount might find itself with inadequate resources despite their efforts.

Clearly there is a trade-off between reducing the savings disincentive in the need analysis system and recognizing the reality that assets increase ability to pay. But it seems reasonable to think that assets which have been saved in order to finance expected contributions will be used up entirely when those contributions are paid. From this perspective, raising the contribution because the assets required to pay it exist is not logical. This problem is discussed further below in the section on allowances against assets.

Home Equity

Federal Methodology does not consider home equity in determining expected family contributions. The logic for this is primarily political. During the 1980's, home prices in many parts of the country increased dramatically. For many homeowners, home equity skyrocketed, reaching levels totally out of proportion with incomes. Families found themselves living in homes they could not possibly afford to buy with their current income levels. This increase in net worth did not have any meaningful impact on consumption opportunities, since if they sold their houses to realize the capital gains, they would not be able to find cheaper housing without diminishing their standards of living considerably. However, since the need analysis system taxed home equity like other assets, an increasing proportion of expected family contributions was attributable to assets, as opposed to income. Families with windfall profits on their homes were not able to borrow against their home equity because of limited cash flow. The difficulties created by these circumstances created considerable political pressure among the middle class to modify the need analysis system.

The problem being addressed was a very real one, but the solution adopted by Congress was inconsistent with economic principles of both equity and efficiency. Choosing to ignore home equity entirely in the newly designed Federal Methodology of the 1992 Reauthorization created significant horizontal inequities, as well as making it difficult to distinguish among families in very different circumstances. While families with artificially inflated home equities might not have reasonably been expected to come up with the contributions prescribed by the old methodology, the new methodology totally ignored the reality that their assets gave them considerable financial strength relative to non-homeowners. The change also exacerbated the problem of treating assets differently depending on the form in which they are held.

Most private institutions relying on their own funds to meet the need of accepted candidates could not ignore home equity without creating huge gaps between measured need and available aid. Some schools continued to treat home equity as they always had - like any other asset. Others adopted a compromise approach, capping home equity at three times annual income. The logic behind this approach is that while home equity clearly increases capacity to pay, the dramatic bubbles in the housing market generated unreasonable expected parental contributions. A rule of thumb in home mortgage markets is that mortgages should not exceed three times gross income. This means that a family cannot afford to buy a home priced at more than three times their income. Families with home equity in excess of this amount are likely to have been the beneficiaries of the housing market bubble — probably a temporary bubble — and should not be asked to deplete their paper assets to finance their children's educations.

The compromise approach recognizes that homeowners have greater ability to pay than renters with similar incomes. At the same time, it recognizes the reality that inflated home prices could generate expected contributions which families are unable to finance and which could lead them into precarious long-run financial situations if they deplete home equity which may be quickly dissipated by the vicissitudes of the housing market.

Pension Assets

One form of asset about which omission from need analysis has generated considerable controversy is pension assets. The income tax code is purposely designed to encourage people to accumulate retirement assets; funds put into these assets are tax-free until they are withdrawn. But the need analysis system does not *intend* to create this incentive.

There is no question that the existence of pension assets increases a family's ability to pay for college. This statement will surely raise objections from some aid applicants, who would argue that the assets must be preserved for retirement and spending them down to pay for education is not a reasonable option, even abstracting from any penalty which might be incurred. But the reality is that families with pension assets have less need to save than similar families without those assets. And borrowing from a pension asset, however unappealing, is an option families without those assets simply do not have.

From an economic perspective, the form an asset takes is irrelevant. Therefore, a perfectly equitable need analysis system would accurately assess pension assets and tax them at a rate identical to the rate applied to other assets. This idea is based on the principle that the choices people make about the form in which to hold their assets should not affect assessment of their long-term financial capacity. The practical problem is that measuring those assets is extremely difficult. Collecting data on IRAs, Keoghs and 401K accounts would be fairly straightforward, if difficult to verify. The same is true of defined contribution pension plans. These are plans under which an individual or his or her employer contributes a certain amount each month. Statements reporting the level of funds in the account are issued regularly and the value of the asset is clear cut.

The problem lies with defined benefit plans, under which the beneficiary can expect a certain monthly benefit upon retirement. This type of plan serves the same purpose as other plans and has the same value to the recipient, but cannot easily be measured in terms of a current asset value and is not accessible to the beneficiary. Assessing all pension plans except defined benefit plans would be a significant horizontal inequity.

One possibility would be to ask all aid applicants whether or not their employers contribute to a pension plan for them. It is reasonable to assume that individuals who belong to employer-contribution plans will be able to live off of those plans at a standard of living at least equal to the "intermediate standard" when they retire, and have no need of a retirement asset protection allowance under the need analysis system. If such a policy were in place, it would be possible to ask the value of IRAs and other retirement assets and use the information for the same purpose — to eliminate the use of a retirement protection allowance. The problem is that such a system would still treat retirement assets differently from other assets.

Allowances Against Assets

Asset Protection Allowance

The Asset Protection Allowance (APA), designed to protect some parental assets for retirement, is a long-standing and standard component of the need analysis methodology. It was part of the Uniform Methodology and was integrated into the Congressional Methodology and the College Board's Institutional Methodology. In the current Federal Methodology, the APA is preserved in its original form, but renamed the Educational Savings and Asset Protection Allowance.

The basic idea of the APA is that parents are not expected to deplete assets necessary for retirement in order to finance their children's educations. Parental assets are protected to the extent that they are required to generate income in retirement which will supplement the average Social Security benefit, allowing the family to live at the prevailing or intermediate income standard for people over the age of 65.

The formula for the Asset Protection Allowance calculates the amount of assets which, if allowed to grow until the older parent reaches the age of 65, would generate the level of annual income which, when added to the average expected Social Security

benefit, will equal the median living standard. This level of assets is excluded from taxation under the need analysis system.

Several questions can reasonably be raised about the APA. The most fundamental is the logic of protecting retirement assets at all. This provision of the need analysis system rests on the assumption that saving for retirement should be the first priority and that educational expenditures are reasonable only as a second priority. A society in which children are expected to provide for their parents in the later years of life would not make this assumption.

If the idea of an APA is accepted, the next question is whether the level of assets being protected is appropriate. The first issue is the income level considered requisite for retirement. This is the BLS intermediate living standard under FM and the CES prevailing living standard under the IM. Both represent average living standards of retired people. This is in contrast to the lower living standard which is used to calculate the IPA. The logic behind this difference is that the IPA is not representative of a living standard, but of a level of income below which virtually no discretionary expenditures are possible. The income necessary for retirement, on the other hand, does represent an actual living standard. In 1995, the prevailing living standard for a couple over the age of 65 was about \$18,500. The reality is that because of the differential college attendance rates among young people from different family income backgrounds, the social prevailing living standard is considerably lower than the expectations of those who send their children to college.

On the other hand, the logic of the APA suggests that the amount of assets protected may be too high for many families. This is because the income from the protected assets is calculated to supplement the *average* Social Security benefit. In fact, Social Security benefits are correlated with contributions to the system, which depend on earnings levels. Individuals with higher earnings pay higher Social Security taxes but also receive higher than average monthly benefits. Low wage earners, on the other hand, cannot expect to receive benefits as generous as the averages might suggest. Given the

rationale underlying the APA, it would be more logical to have a system which allows low wage earners a higher asset protection allowance than they currently have, and high wage-earners a lower APA. Those who can anticipate higher than average Social Security benefits will need lower supplemental income from their private assets to attain the median living standard, so the logic for giving them the standard APA is weak.

This earnings-sensitivity of Social Security benefit levels has led to the suggestion that the APA be earnings-sensitive, with higher APA's for lower-earning people. In fact, those with incomes above the low \$30,000's in 1996 do not need any supplemental income, because their expected Social Security incomes exceed the intermediate living standard. One problem with this approach would be that those families who are able to disguise their earnings to minimize income tax payments or maximize financial aid will experience an even greater benefit through the APA. Truly low-income families are unlikely to have sizable assets to protect under the APA. Nonetheless, the reality that Social Security benefits for many families will exceed the median living standard means that the current logic for calculating the APA is flawed.

It would appear logical either to make the APA earnings-sensitive, to abandon the idea of protecting retirement savings, or to revise the logic behind the calculations. The APA may be subject to increasing criticism as uncertainty about the future of the Social Security system mounts. There is already considerable skepticism about the idea that benefits projected on the basis of current policy will really be available to future retirees. If fundamental changes in the system, such as allowing funds to be invested privately, are implemented or even seriously debated, the current logic of the APA will have to be revisited. Meanwhile, families can be assured that some portion of their assets will be protected from taxation and even the maximum 5.6% tax rate on assets will not be applied to assets below the APA level, which increases with the age of the older parent.

Other Allowances Against Assets

While the prevailing methodologies protect no assets other than those for retirement from taxation, both aid professionals and economists have expressed concern about the reality that families who save for college find their expected contributions increasing as a result of these savings. While the increase is relatively small, it is counterproductive in an environment where encouraging saving for college is a dominant theme. This problem, combined with the questions raised above about the current retirement Asset Protection Allowance, suggests that it might be constructive to rethink the purposes for which assets should be protected from taxation in the need analysis system.

One frequent suggestion is for an Educational Savings Protection Allowance (ESPA). Unlike the ESAPA in current Federal Methodology, such an allowance would protect savings not related to retirement considerations. An ESPA would set a level of assets which families at given income levels might be expected to have saved to prepare to pay their expected contributions and would protect that level of assets from taxation. The expectation would be that these assets would be entirely depleted to finance expected contributions. Only assets greater than those required to pay the contributions based on income would be subject to asset taxation. The ESPA would be in addition to any other deduction from assets included in the need analysis methodology.

Another possible motivation for protecting assets is that all families would be well-advised to have some amount of liquid assets in reserve for unforeseen contingencies. Some financial aid administrators have proposed an emergency reserve allowance to accommodate this need. This would be an allowance against assets which would allow families (and individuals) to have a given amount of assets set aside which they would not be expected to tap for educational expenditures.

Marginal Tax Rates

The need analysis system taxes available income based on a graduated tax rate table which begins at 22% and goes up to 47%. The rates in this table are *marginal* tax rates. This is the tax rate applied to extra dollars of income. It is not the overall tax rate on income. If the marginal rate is 22% and an aid applicant's income exceeds the allowances against income by \$100, she will be asked to contribute \$22. For every additional dollar of earnings, she will contribute an additional 22 cents. The effective tax rate on earnings is much lower than this. If the allowances add up to \$20,000 and the applicant's income is \$20,100, the \$22 expected contribution will be just one-tenth of one percent of total income. A family or individual in the 47% marginal tax bracket also contributes much less than 47% of its income. The 47% tax rate on the last dollar is much higher than the 22% tax rate on the first dollars of available income and the 0% tax rate on income below that level.

Economists focus on marginal tax rates quite a bit because even though they seem to exaggerate tax burdens, they are, as discussed in Part I, the basis of the potential negative incentive effects of taxation. People generally make decisions about working and spending at the margin. Choosing to reduce one's income to zero to avoid taxes altogether is unlikely. But if a worker is deciding whether to take a few hours of overtime or not, the question of what portion of the extra wages he will be able to keep after taxes can be quite significant. If the marginal tax rate is high, he may decide it's not worth the effort.

One way in which the marginal tax rates in the need analysis system might have a significant effect is on a family's second earner. Considerable empirical evidence confirms that in the economy as a whole, married women's labor supply is most sensitive to changes in marginal income tax rates. A second earner may be in the situation of facing a 47% tax rate through the need analysis system on the first dollar earned after federal

and state income taxes. Why get a job when the financial aid for your child will fall by almost 50% of your after-tax earnings?

This means that although high marginal tax rates may be appealing because people with large amounts of discretionary income should be willing to spend a large portion of it on their own or their children's education, the negative incentive effects must be considered in determining the appropriate assessment rate schedule.

While the marginal tax rate schedule incorporated in the need analysis system is a critical determinant of expected contribution levels, it is perhaps the most difficult component of the system for which to construct a logical argument based on economic principles.

There is a long-standing debate within the economics profession about the justification for progressive taxation. A progressive tax is defined as one under which higher income people pay a higher percentage of their incomes in taxes. This is in contrast to a proportional tax, which taxes everyone at the same rate, and a regressive tax, under which income and the overall tax rate are inversely related. While it is intuitively pleasing to believe that wealthier people can give up a larger percentage of their incomes without undue suffering, there is really no way to quantify the sacrifices made by different people or to equalize burdens. Over the years, there have been debates about whether everyone should make equal absolute sacrifices, equal marginal sacrifices or equal relative sacrifices. Should everyone pay equal dollar amounts? Equal proportions of their incomes? Is it possible to prove that people with higher incomes can give up a higher percentage of their incomes, while experiencing no greater sacrifice than lower income people who are asked to pay a lower percentage of their incomes?

Economists have not found a resolution to this quandary. In the end, because levels of sacrifice cannot be measured and cannot easily be compared across individuals, efforts to define equity in such specific terms have been largely abandoned. Nonetheless, there is a general consensus that progressive taxation is more equitable than proportional taxation, that asking someone who earns \$70,000 a year

to contribute \$14,000 is less onerous than asking someone who makes \$30,000 a year to contribute \$6,000. It is quite reasonable that the need analysis system rests on similarly subjective principles.

The argument that the tax rate should be progressive is, while not air tight, quite convincing. But the argument for any specific set of tax rates is much more tenuous. The current tax rate structure has been in existence for many years, originating with the Uniform Methodology and carrying over into Congressional, Federal, and Institutional Methodologies. It is probably accurate to say that the reason these rates have stayed constant for so long is that there is no compelling argument to change them — not that they are clearly the optimal rates to apply to income.

The issues are not just what the lowest and highest marginal rates and the width of the income bands to which they apply should be. A progressive tax structure does not depend on a graduated rate structure at all. As is frequently pointed out in discussions of proposals to replace the current federal income tax with a flat tax, as long as there are exemptions and/or deductions from income, a single marginal tax rate will create a progressive tax system. Suppose, for example, that families were expected to contribute 30% of all of their income above the level of the IPA. The IPA for a family of four with one in college in 1995-96 was \$17,150 under FM. This means that a family with an after-tax income of \$30,000 would be expected to contribute .30 (\$30,000-\$17,150) or \$3,855. This would amount to an effective tax rate of 13% on after-tax income. By contrast, a family with an after-tax income of \$60,000 would be expected to contribute .30 (\$60,000-\$17,150) = \$12,855, or 21% of their after-tax income. In other words, a single tax rate generates a progressive tax unless all income, from the first dollar on, is taxed.

Accordingly, it is reasonable to assume that any debate about the appropriate tax rate schedule for the need analysis system is not about whether or not the tax should be progressive, but about how progressive the tax should be. The current rate structure for the income of parents of dependent students and of independent students with

dependents is based on income bands of \$2,600, with the rates going from 22% on adjusted available income (AAI) up to \$10,300 to 25%, 29%, 34%, 40%, and 47%, with the top rate applying to all AAI over \$20,700. This is an arbitrary rate structure.

Many discussions about the appropriateness of the current need analysis system focus on the tax rate schedule, in the sense that they are concerned with whether the contributions expected at different income levels are too high, too low, or about right. While there may be some exemptions to income or assets which would differentially affect families and individuals at different income levels, the best way to adjust these relative burdens is through the marginal tax rate schedule. While there is no right answer to what the optimal tax rate schedule would be, there are several ways of looking at the schedule which may be useful for financial aid administrators attempting to adjust the contributions expected from their constituencies.

1) The income level at which the lowest marginal tax rate sets in can be modified. Raising this zero bracket amount would lower effective tax rates on all aid applicants, since everyone would have more income exempt from taxation. It would, however, have a proportionately larger impact on people at lower income levels. Suppose, for example, that the IPA were increased by \$2,000, to \$19,150 from the 1995-96 FM level of \$17,150. This would mean that all expected contributions would fall by 22% of \$2,000, or \$440, since everyone currently faces this tax rate on the first \$2,000 of AAI. The effect on applicants with incomes reaching into higher marginal tax brackets would be greater than this if the number of dollars taxed at the 22% rate remained the same as under the current structure, since \$2,000 of income would move down from the 25% bracket to the 22% bracket. For those in the 47% bracket, contributions would decline by $(.47-.40) \$2,000$, or an additional \$140 as a result of the movement of income down the graduated rate scale.

2) The income brackets to which each of the tax rates applies can be widened. Under the current system, each tax rate applies to the relatively small amount of \$2,600. This means that the marginal tax rate increases rapidly, with families with total incomes

of about \$40,000-\$50,000 falling into the highest marginal tax bracket. If the bands were widened, say to \$5,000, the contributions for everyone except those currently in the 22% tax bracket would decline, with the highest marginal rate taking effect at a significantly higher level of adjusted available income. The impact at different levels of the income distribution would depend on how the bands were adjusted and whether or not the rates themselves were altered.

3) The rates could be modified. There is no particular reason why the rates should range from 22% to 47%. Changing the rates can be an effective way of redistributing the expected contribution burdens. Modifications of the rates could take a variety of forms and evaluating them is really a matter of individual judgment. More rates could be added so that the marginal tax rate would increase more gradually. The lowest rate could be increased, say to 25% or 30% in order to generate higher expected contributions for those with small amounts of AAI.

One caveat based on economic analysis relates to the question of how high the top marginal tax rate should be. Aid administrators frequently argue that it would be reasonable to raise the highest marginal tax rate, assuming that it takes effect at an income level higher than the one at which the 47% rate currently sets in. Despite the logic of this argument, based on making education the first priority, it is important to remember that the need analysis tax rate comes on top of personal income tax rates. The negative incentive effects of high marginal tax rates discussed above dictate caution in this regard.

Incentive effects are also relevant for independent and dependent student earnings taxation rates. The current marginal tax rate of 50% on the after-tax incomes of both dependent students and independent studies without dependents probably discourages some students from working to earn more than the income set-aside allowed in FM or the minimum student contribution required by some schools allocating their own funds. It is understandable that some professional schools choose to apply even higher

marginal tax rates to the incomes of independent students whose future income prospects are very promising. Nonetheless, this practice is likely to significantly diminish student work effort.

Tax Rates on Assets

The established need analysis methodologies add 12% of positive discretionary assets to available income to generate adjusted available income (AAI). The marginal tax rate is applied to AAI, so the marginal tax rate on assets is 12% of the applicant's marginal tax rate on income. In other words, assets are taxed at a higher rate for higher income aid applicants than for lower income aid applicants. The logic behind this approach is that households with higher incomes can afford to spend down their assets at a higher rate than lower income families can.

As is the case for many other aspects of the need analysis system, there are a variety of reasonable economic perspectives on this issue. While there is clearly a link between income and assets in determining both standard of living and ability to finance education, the existing logic is not necessarily the best. As discussed above, the correlation between income and assets is far from perfect. Under the current system, families who are able to shelter most of their incomes, but who have considerable discretionary assets, pay a low marginal tax rate on their assets. If assets were taxed at a constant rate, this problem would not exist. It also seems reasonable to argue that the tax rate on assets might more appropriately be related to asset levels than to income levels.

An alternative approach to assessing contributions might be to separate income and assets and tax all discretionary assets at a flat rate, while maintaining a graduated rate structure for income. This would simplify the system conceptually because it would eliminate the whole idea of converting assets to income. It would, however, be a significant departure from current practices.

Conclusion

An understanding of basic economic principles and of the economic theory relevant to need analysis cannot solve all of the difficult problems involved in the equitable and efficient allocation of limited student aid funds. But it can provide a framework for making decisions on campus and for evaluating proposals for modification of the need analysis system. Although reasonable people will always disagree about the details of the methodology, a shared knowledge of the underlying assumptions and the likely effects of various practices should raise the level of the debate from personal opinion to informed analysis.

Need-based aid is likely to come under increasing scrutiny and pressure as enrollment management tensions mount. Aid administrators who have the theoretical tools to evaluate the foundation and the specific elements of need analysis will be in a much better position to defend the system than will those who must rely on the general notion that it is "fair." The concepts presented in this *Primer* should open the door to more complete analysis of the entire aid system and its relationship to the future of higher education opportunities.

About the Author

Sandy Baum is a professor of economics and chair of the Economics Department at Skidmore College in Saratoga Springs, NY. She has worked with CSS and NASFAA on need analysis issues since the late 1980's. Sandy has been the principal economics consultant to both the CSS Committee on Standards of Ability to Pay and its successor the Financial Aid Standards and Services Advisory Committee. She has served as a frequent consultant to NASFAA, as a panelist on many of their programs, and has worked closely with the Department of Education on a variety of higher education issues.

Sandy is one of the few economists in the country who has an in-depth working knowledge of the financial aid system. She has a comprehensive understanding of the complex issues facing both financial aid and admissions professionals shared by few of her peers.



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